CLAIMS

1. A diesel engine having cylinders and pistons defining expansible combustion chambers into which combustion supporting gas is compressed during compression strokes of the pistons for compression ignition and burning of injected fuel to drive a crankshaft, intake and exhaust valves actuated by crankshaft driven intake and exhaust camshafts for controlling the timed admission of air to and the discharge of exhaust from the combustion chambers, and the improvement comprising:

a cam phaser operative on the exhaust camshaft to selectively advance timing of only the exhaust valves relative to a nominal position to advance exhaust valve closing sufficiently to increase trapped exhaust gases, thereby increasing combustion temperatures in the combustion chambers for controlling combustion stability and exhaust emissions under predetermined conditions of operation.

2. A diesel engine as in claim 1 including a control effective to advance said cam phaser to increase the trapped exhaust gas for engine operation at one or more of cold engine, cold ambient and low load conditions to increase combustion temperatures.

3. A diesel engine as in claim 2 wherein the control is responsive to engine operating conditions selected from the group consisting of engine temperature, ambient temperature, exhaust gas constituents, engine load and combinations thereof.

4. A diesel engine as in claim 1 further comprising an intake cam phaser operative on the intake camshaft to selectively retard timing of only the intake valves relative to a nominal position to retard intake valve closing

sufficiently to allow trapped exhaust gases to expand substantially to an uncompressed ratio.

5. A diesel engine as in claim 1 wherein the control is effective to vary exhaust valve timing from a nominal setting to an advanced closing timing of up to about 80 degrees of crankshaft rotation.

6. A method of operating a diesel engine including intake and exhaust valves for controlling exhaust emissions and improving combustion stability during selected conditions of engine operation comprising:

providing a cam phaser connected with an exhaust camshaft and operable to selectively advance exhaust cam timing relative to a nominal position for controlling timing of the exhaust valves; and,

actuating the cam phaser to advance exhaust cam timing for engine operation during predetermined engine operating conditions to provide increased in-cylinder temperature of cylinder charge gases.

7. A method as in claim 6 wherein said predetermined engine operating conditions are selected from the group consisting of engine temperature, ambient temperature, exhaust gas constituents, engine load and combinations thereof.

8. A method as in claim 6 wherein the in-cylinder temperature is increased to lower hydrocarbon exhaust emissions.

9. A method as in claim 6 further comprising:

providing an intake cam phaser operative on the intake camshaft to selectively retard timing of only the intake valves relative to a nominal position for controlling timing of the intake valves; and

actuating the intake cam phaser to retard intake cam timing for engine operation during said predetermined engine operating conditions to reduce thermodynamic losses occasioned by advanced exhaust cam timing.

10. A diesel engine having cylinders and pistons defining expansible combustion chambers into which combustion supporting gas is compressed during compression strokes of the pistons for compression ignition and burning of injected fuel to drive a crankshaft, intake and exhaust valves actuated by crankshaft driven intake and exhaust camshafts for controlling the timed admission of air to and the discharge of exhaust from the combustion chambers, and the improvement comprising:

an first cam phaser operative on the exhaust camshaft to selectively advance timing of only the exhaust valves relative to a nominal position to advance exhaust valve closing sufficiently to increase trapped exhaust gases, thereby increasing combustion temperatures in the combustion chambers for controlling combustion stability and exhaust emissions under predetermined conditions of operation; and,

a second cam phaser operative on the intake camshaft to selectively retard timing of only the intake valves relative to a nominal position to retard intake valve closing sufficiently to allow trapped exhaust gases resulting from advanced exhaust valve closing to expand substantially to an uncompressed ratio.